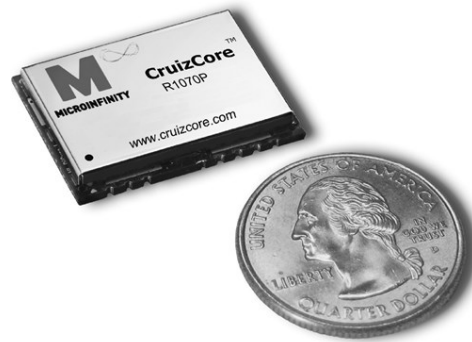


## Features

- Heading reference for robot-cleaner
- Angle & Angular rate output
- Ultra Low Bias Drift
- High Resolution and Accuracy
- Outstanding Scale Factor Linearity
- Fast Start-up
- Fully Self Contained
- UART Digital Output
- Low Power Consumption
- Low Cost, Compact Package



## Applications

- Robotics, Vehicles, Aerospace, Virtual Reality, Medical Devices

## Description

The CruizCore® R1070P is a fully self-contained MEMS digital gyroscope for measuring heading angles. The R1070P is a low-cost but very accurate sensing solution. The R1070P is the perfect substitute for high performance and highly reliable mechanical or optical gyroscopes used in robotics, stabilization, guidance and control systems. It is a highly compact with digital UART communication interfaces. The R1070P uses MEMS sensors resulting in low-cost and high reliability. The patented bias and scale-factor error estimation algorithm minimizes the bias drift and angle error due to the temperature variation. The start-up time is less than 1 second, which is used to compute bias parameters; it does not require further calibration thereafter.

The R1070P has 50Hz bandwidth and precisely measures angular rates up to  $\pm 200$  °/sec. The default output is the angular rate and heading angle. The R1070P provides the best solution for low-cost but very accurate consumer robot applications.

## Specification

Performance	General	Bandwidth	50 Hz (Max.)
		Data Output Rate	100 Hz (10, 25, 50Hz Selectable)
	Angular Rate	Input Range	$\pm 200$ °/sec (Max.)
		Scale Factor Error	1 % (Max.)
		Bias Drift	50 °/hr (Max.)
	Relative Angle	Resolution	0.01 ° (max.)
		Proportional Error	1% (Max.)
Drift Error		60 °/hr (Max.)	
Physical	Weight	3 grams	
	Size	25 mm X 20 mm X 3.0 mm	
Electrical	Power Consumption	13 mA (Typ. @3.3V)	
	Input Voltage	3.2 ~ 5.5 V	
Environmental	Operating Temperature	-20 ~ 80 °C	
	Storage Temperature	-40 ~ 85 °C	

Table 1. Pin Functions

Pin Name	Function
VDD	Main power (3.2~5.5VDC)
GND	Power ground
TxD	UART transmit data
RxD	UART receive data
SCLK	SPI communication clock (optional)
MISO	SPI master input, slave output function (optional)
MOSI	SPI master output, slave input function (optional)
nSSEL	SPI slave select function (optional)
nRST	System reset input
I2C SCK	I2C clock line (optional)
I2C SDA	I2C data line (optional)
Reserved	Reserved for additional functions

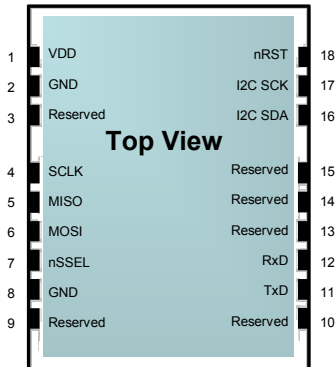
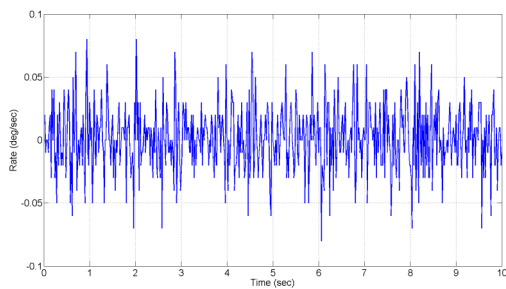
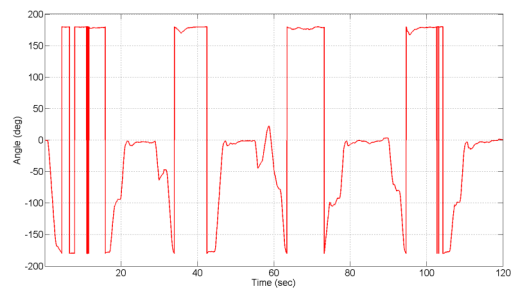


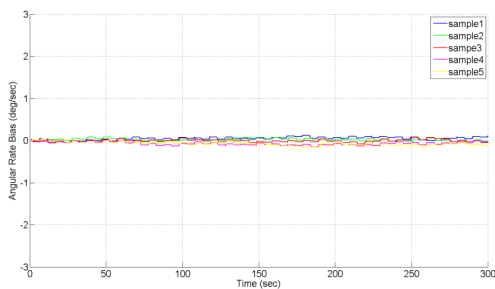
Figure 1. Pin Arrangement



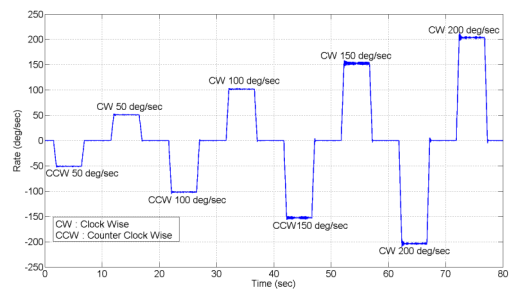
(a) Rate Short Term Noise



(b) Angle Output (Robot Test)



(c) Angular Rate Bias Drift



(d) Angular Rate Input Range

Figure 2. Performance Test